

Remarks/Discussion of Issues

Claim Summary

In this Amendment, claims 2, 11 and 19 have been amended. Claims 2-19 are pending in the application. Applicant respectfully submits that all pending claims are in condition for allowance.

35 U.S.C. § 103 Rejections - Claims 2-19

The Final Office Action of June 12, 2008, rejects claims 2-19 under 35 U.S.C. § 103(a) as being unpatentable over TAKAHASHI et al. (U.S. Patent No. 6,717,355) in view of KAMIKAWA et al. (U.S. Patent No. 6,628,249). Applicant respectfully traverses the rejection because no proper combination of TAKAHASHI et al. and KAMIKAWA et al. teaches or suggests each and every element of the claims.

As stated in MPEP § 2143, in order to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

Applicant's silence on certain aspects of the rejection is by no means a concession as to their propriety. Rather, because the applied art fails to disclose at least one feature of the claims, for at least the reasons discussed below, Applicant respectfully submits that the rejections are improper and should be withdrawn.

Claim 2

Claim 2 recites, in part:

"... sensing a correlated color temperature (CCT) of the LED emission spectra of the LED; determining a modulation for a driving current signal based on at least the sensed CCT; ...wherein determining the current signal modulation

comprises determining a first color coordinate set representing the LED emission spectra at a first operational temperature corresponding to a desired CCT, and determining a second color coordinate set representing a CCT shift in the LED emission spectra due to operation of the LED at a second operational temperature corresponding to the sensed CCT, the color temperature correction corresponding to the CCT shift."

No proper combination TAKAHASHI et al. and KAMIKAWA et al. teaches or suggests at least these claim features.

The Examiner acknowledges that TAKAHASHI et al. does not disclose determining current signal modulation by determining a first color coordinate set at a first LED operational temperature and determining a second color coordinate set representing a CCT shift due to operation of the LED at a second operational temperature, and therefore relies on KAMIKAWA et al. in combination with TAKAHASHI et al. to teach the same, referring to col. 1, lines 42-48, and col. 5, lines 1-3, in particular. See Final Office Action, p. 4.

KAMIKAWA et al. describes a phenomenon in which the wavelength of light emitted from AlGaAs semiconductor light emitting devices becomes longer as a driving current and temperature increase, referred to as the "red shift phenomenon." Col. 1, lines 38-43. However, simply identifying such a phenomenon does not teach or suggest actually determining a current signal modulation, including determining first and second color coordinate sets, respectively corresponding to a desired CCT at a first operational temperature and a CCT shift due to operation of the LED at a second operational temperature.

The Examiner asserts that KAMIKAWA et al. discloses a driving method that uses "two parameters (peak value and average power) of a driving current pulse," and that the "rest of the specification confirms that the modulation is a current modulation scheme." See Final Office Action, p. 2. However, disclosed use of current modulation does not teach or suggest the specific recitation of how the modulation is determined. The Examiner thus relies on col. 5, lines 1-3, of KAMIKAWA et al. to teach determining modulation to cause a color temperature

correction which corresponds to the CCT shift. See Final Office Action, p. 5. This portion of KAMIKAWA et al. provides, in its entirety, a "method for driving an LED device in which variation of the emission intensity and light color of the LED device can be suppressed." However, there is no reference to the red shift phenomenon discussed above, or actually determining a current signal modulation, specifically by determining a first color coordinate set representing the LED emission spectra at a first operational temperature corresponding to a desired CCT, and determining a second color coordinate set representing a CCT shift in the LED emission spectra due to operation of the LED at a second operational temperature corresponding to the sensed CCT. The cited section of KAMIKAWA et al. is silent as to how the variation of emission intensity and light color can be suppressed.

Further, claim 2 has been amended to clarify that a correlated color temperature (CCT) of the LED emission spectra of the LED is sensed and the modulation for a driving current signal is determined based on at least the sensed CCT. Further, the first color coordinate set represents the LED emission spectra at a first operational temperature corresponding to a desired CCT, and the second color coordinate set represents a CCT shift in the LED emission spectra due to operation of the LED at a second operational temperature corresponding to the sensed CCT. No proper combination TAKAHASHI et al. and KAMIKA et al.

Accordingly, because the combination of TAKAHASHI et al. and KAMIKAWA et al. fails to teach or suggest each and every claim recitation, the rejection of claim 2 under 35 U.S.C. § 103(a) should be withdrawn.

Applicant notes that claims 11 and 19 have been amended to include recitations similar to claim 2, and therefore submit that claims 11 and 19 are likewise patentable over any proper combination of TAKAHASHI et al. and KAMIKAWA et al. for substantially the same reasons.

Claims 3-10 and 12-18

Claims 3-10 and 12-18 depend, directly or indirectly, from claims 2 and 11, respectively, and are therefore allowable for at least the reasons discussed above. Claims 3-10 and 12-18 are further allowable in view of their additional recitations.

For example, claim 3 recites, in part, "wherein applying the determined current signal modulation to the LED causes the LED emission spectra at the first color coordinate set to be substantially constant as the LED operational temperature changes from the first LED operational temperature to the second LED operational temperature." The Examiner acknowledges that TAKAHASHI et al. does not disclose the recitations of claim 3, and therefore relies on col. 1, lines 42-48, and col. 5, lines 1-3 of KAMIKAWA et al. to teach the same. See Final Office Action, pp. 5-6.

However, as discussed above with respect to claim 2, col. 1, lines 42-48, merely identify a phenomenon in which light wavelength increase in response to increased temperature, and col. 5, lines 1-2, states that variations in emission intensity and light color may be suppressed. There is no teaching or suggestion of the LED emission spectra at the first color coordinate's being substantially constant as the LED operational temperature changes from the first LED operational temperature to the second LED operational temperature.

CONCLUSION


In view of the foregoing explanations, Applicant respectfully requests that the Examiner reconsider and reexamine the present application, allow claims 2-19, and pass the application to issue. In the event that there are any outstanding matters remaining in the present application, the Examiner is invited to contact Van C. Ernest (Reg. No. 44,099) at (571) 283-0720 to discuss these matters.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment (except for the issue fee) to Deposit Account No. 50-0238 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17, particularly extension of time fees.

Respectfully submitted,
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